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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/971,707	10/09/2001	Taku Takeishi	214699US0CONT	4265

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ALEXANDRIA, VA 22314

EXAMINER

THOMPSON, CAMIE S

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 06/04/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/971,707

Applicant(s)

TAKEISHI ET AL.

Examiner

Camie S Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 9 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 3. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3, 5-10, 12-14 and 21-25 rejected under 35 U.S.C. 102(b) as being anticipated by Nunomura et al., U.S. Patent Number 4,757,235.

Nunomura discloses an electroluminescent display device wherein the substrate portion comprises a ceramic base with internal wiring electrodes with a first insulating layer on a substrate with embedded electrodes as per instant claim 1 (see column 12, lines 55-63 and Figure 9). The reference also discloses that barium titanate may be used in the dielectric layer as per instant claims 3 and 9 (see column 8, lines 32-35). Additionally, Nunomura discloses that yttrium oxide can be used in the high dielectric constant ceramic insulator layer as per instant

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claim 5 (see column 6, lines 3-34). Column 13, lines 11-32 of the reference disclose a substrate having embedded electrodes with a first insulating layer, a luminescent layer on top of the first insulating layer, a second insulating layer with a second electrode layer on top of the second insulating layer as per instant claims 7 and 8. The internal electrodes may be made of silver (Ag) or a silver-palladium (Ag-Pd) alloy as per instant claims 12 and 13 (see column 6, lines 60-61). Column 8, lines 33-35 of the reference also disclose that the insulating dielectric layer may contain silicon oxide ( $\text{SiO}_2$ ) as per instant claim 6. Nunomura discloses in column 13, lines 25-32 that the second electrode may be ITO as per instant claim 14. A transparent ITO electrode has a resistivity of up to 1 ohm cm is a physical property of the electrode and is therefore inherent. Additionally in column 13, it is disclosed that zinc sulfide is used as the luminescent layer as per instant claims 23-25. The coefficient of thermal expansion is not shown by Nunomura. However, the Nunomura reference uses barium titanate as the substrate just as applicant does. The range of the coefficient of thermal expansion would be inherent since the same material is being used.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1-2, 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al in view of JP 06-084692.

Nunomura discloses an electroluminescent display device wherein the substrate portion comprises a ceramic base with internal wiring electrodes with a first insulating layer on a substrate with embedded electrodes as per instant claim 1 (see column 12, lines 55-63 and Figure 9). The coefficient of thermal expansion for a substrate having barium titanate as the dielectric insulating layer would be in the range of 10 to 20 ppm/K as this is a physical property and is therefore inherent as per instant claim 1. The Nunomura reference does not disclose that dielectric insulating layer can contain an oxide such as magnesia and manganese oxide as per instant claims 2 and 4. The Japanese patent teaches a laminating type ceramic chip device that has a dielectric layer with the composition of MgO as 0.1-3.0 mol; MnO as 0.05-1.0 mol as per instant claims 2 and 4. The dielectric layer of an electroluminescent device enhances the luminescence and stability of the EL device by limiting the electric current passing through the luminescent layer. Magnesia and manganese oxide are high dielectric materials. Therefore, it would have been obvious to one of ordinary skill in the art to use MgO and MnO in the Nunomura reference in order to have a high dielectric insulating layer for improved stability and luminescence (see Nunomura reference, column 1, lines 23-29). Although the Japanese reference teaches a mixture of barium oxide and calcium oxide along with silicon oxide as the dielectric layer with MgO and MnO, it would have been obvious to one of ordinary skill in the art to use mainly magnesia to obtain the high dielectric insulating layer as per instant claim 11.

6. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al., U.S. Patent Number 4,757,235 in view of Chung, U.S. Patent Number 5,352,622.

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Nunomura discloses an electroluminescent display device wherein the substrate portion comprises a ceramic base with internal wiring electrodes with a first insulating layer on a substrate with embedded electrodes as per instant claim 1 (see column 12, lines 55-63 and Figure 9). The coefficient of thermal expansion for a substrate having barium titanate as the dielectric insulating layer would be in the range of 10 to 20 ppm/K as this is a physical property and is therefore inherent as per instant claim 1. The Nunomura reference does not disclose the use of a dopant on the second electrode. Chung teaches a stacked capacitor with a thin film ceramic oxide layer. The Chung reference also discloses that the second electrode can be amorphous or polycrystalline silicon that has been doped as per instant claims 17-19 (see column 9, line 60-column 10, line 2). The silicon based electrode reacts at a higher temperature. Therefore, it would have been obvious to one of ordinary skill in the art to use a silicon based second electrode in order to achieve greater stability of the EL device.

7. Claims 15-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nunomura et al., U.S. Patent Number 4,757,235 in view of Arai et al., U.S. Patent Number 6,340,537.

Nunomura discloses an electroluminescent display device wherein the substrate portion comprises a ceramic base with internal wiring electrodes with a first insulating layer on a substrate with embedded electrodes as per instant claim 1 (see column 12, lines 55-63 and Figure 9). The coefficient of thermal expansion for a substrate having barium titanate as the dielectric insulating layer would be in the range of 10 to 20 ppm/K as this is a physical property and is

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therefore inherent as per instant claim 1. The Nunomura reference does not disclose the use of an IZO electrode or a dopant as per instant claims 15-16 and 20. Arai teaches an organic electroluminescent device, which has an insulating layer (see abstract). The Arai reference also teaches that the secondary electrode can be zinc-doped indium oxide (IZO) as per instant claim 16 and has a proportion of 12-32 weight percent of ZnO mixed with indium oxide (see column 6, lines 57-68). Additionally, the Arai reference discloses that the second electrode can be tin-doped indium oxide (ITO) and has a proportion of 1-20 weight percent of tin oxide mixed with indium oxide as per instant claim 15 (see column 6, lines 57-68). The secondary electrode provides the luminescence necessary as a light emitting device. Therefore, it would have been obvious to one of ordinary skill in the art to use ITO and IZO in the above weight percentages as the secondary electrode in order to provide a light transmittance of at least 50% as shown by the Arai reference in column 7, lines 4-20.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (703) 305-4488. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly, can be reached at (703) 308-0449. The fax phone numbers for the Group are (703) 872-9310 {before finals} and (703) 872-9311 {after finals}.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

CYNTHIA H. KELLY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

